

or 743.2, wind SE. by E., violent gale of hurricane force, and heavy rain of short duration. On the 14th S. S. *Ohio* reports, in 49° 49' N. 26° 55' W., barometer 29.35 or 745.5, wind WSW. 6, with hail. From the 15th to the 18th, low pressure, with hard gales and high seas, continued to prevail over the eastern portion of the Atlantic (between 45° and 55° N.), and from the 16th to the 19th a low pressure area (No. X, March REVIEW) moved rapidly northeastward from the American coast, crossing the Banks of Newfoundland on the 17th, to about 55° N. 30° W. on the 19th. On the 19th and 20th, low area No. VI (No. XI of the March REVIEW) passed rapidly eastward as a severe hurricane, from the American coast, between Nova Scotia and the Bermudas, to about 50° W. S. S. *Celtic*, 20th, in 40° N. 63° W., 7.35 a. m., Washington time, reports barometer 28.53 or 724.6, wind N. by W., force 12, and also adds "from 10 a. m. until 4 p. m. terrific gale from N., with hurricane force at times, compelled to steer ship before the sea to avoid damage, the wind having veered from E. to N., with a tremendously high confused sea." S. S. *Ohio* reports 19th, 43° N. 54° W., barometer 30.14, NW. 3, snow; 20th 42° N. 58° W., barometer 28.82, NW. 11, thick snow storm; and 21st, 40° N. 66° W., 29.84, SE. 2, snow; and adds "from midnight (19th and 20th) to 4 p. m., 20th, violent gale, commencing at ESE. and backing to N., with very heavy squalls and thick snow, barometer falling rapidly—kept ship before the sea until 7 p. m." As instances of the unsettled condition of the weather prevalent over this portion of the Atlantic during the latter half of March the following may be noted: the *Ohio* reported snow or hail on each day from the 14th, in 50° N. 27° W., to the 21st, in 40° N. 66° W., the barometer observations showing low pressures on the 14th, 16th, 18th and 20th; the *Nederland*, from the 17th, in 48° N. 19° W., to the 29th, in 40° N. 73° W., reported "much rain" for the 24 hours preceding the reports of the 17th, 19th, 21st, 22nd, 23rd and 28th, "rain" on 25th, "showers" on 20th and "snow" on the 24th, 27th and 29th, had low pressures on the 17th, 19th, 22nd, 25th and 28th. During the hurricane of the 19th, 20th and 21st many disasters to shipping occurred, among which the following may be noted: Brig *Rescue* abandoned in 39° N. 70° W.; Brig *Victor* abandoned in 37° N. 58° W.; Bark *Memphis* abandoned in 39° N. 59° W.; Ship *Wassenaar* abandoned in 44° N. 39° W.; Bark *May Queen* lost two men overboard; Bark *Queen of Hearts* in 38° N. 62° W. lost three men overboard; while numerous vessels had decks swept of everything movable. From the 22nd to the 26th this storm moved very slowly northeastwards with diminished energy near the center, but followed by northwest gales, high seas, rain, sleet or snow from 35° to 55° W. Low area No. IX (No. XIV March REVIEW) passed off the New England coast on the 24th, and moved east and northeastward off the coasts of Nova Scotia and Newfoundland during the 25th and 26th, accompanied by very low pressures and followed by northwesterly gales and high seas. On the morning of the 28th, while low area No. XV was yet central over the United States, a second centre had formed off the Middle Atlantic coast, which rapidly developed into a severe storm (see No. XI present REVIEW). During the 28th, 29th and 30th it moved rapidly east and northeastward, and was encountered by the following vessels: Schr. *Addie Fuller* on the 26th, in 32° N. 80° W., 28th, in 35° N. 75° W. and 30th in 35° N. 73° W., reports: "26th, at sunset, weather threatening; midnight, gale commenced with S. wind, which lasted until morning of the 28th; it veered gradually to WSW; had occasionally terrific squalls during the gale, with velocities of 40 or 50 miles; 27th, midnight, the barometer was at its lowest (29.50 as read off); 28th, fine weather and nearly calm all day, barometer continuing low; at 8 p. m. gale commenced with wind from NNW., increasing in force from 20 to 50 miles, and continued until morning of the 31st, with severe squalls of hail and rain." S. S. *Scythia* reports: "28th, 43° N. 55° W., barometer 29.70 or 754.4, wind S., heavy rain; 29th, 42° N. 59° W., 29.33 or 745.0, NW. by W., force 4, cloudy, rough sea; and adds "Sunday, March 28th, from 3 p. m. to Monday, 29th, 4 a. m., storm with wind veering from SW. to W'ly and N'ly, with very high sea, barometer 29.28." S. S. *Hibernian*, 29th, in 53° N. 26° W., and 30th, in 52° N. 31° W.—"29th, heavy gale from S., with torrents of rain and heavy sea; 30th, strong gale from WSW., with heavy sea, lowest barometer 29.22 or 742.2." On the 30th the barometer fell rapidly over northwestern Europe, thereby ending the period of high pressures which had continued since the 8th over this region. During the 31st the low area No. XI passed eastward over the British Isles and ushered in a period of unsettled weather, which continued over these Isles until the 6th of April. By afternoon of the 28th low area No. XV of the March REVIEW, referred to above, had passed off the American coast; during the 29th and 30th it moved slowly eastward between the Bermudas and Nova Scotia, and on the 31st was central some distance south of Newfoundland. The lowest pressures of the month, accompanied by thunder, lightning, rain and moderate gale, were experienced at the Bermudas on the 29th and 30th.

TEMPERATURE OF THE AIR.

The mean temperatures for April, 1880, are shown on chart No. II. The table of average temperatures on that chart shows that the temperature was above the normal from Texas and the Mississippi valley eastward to the Atlantic, except in the lower St. Lawrence valley, and the Canadian Maritime Provinces. Over the entire country westward of Texas and the Mississippi valley deficiencies were reported, except from the Middle Rocky Mountain Slope. The greatest excess of temperature prevailed in the Middle, South Atlantic, Gulf States, Tennessee and the Ohio valley, ranging from 3.0 to 4.0 above the normal. The deficiency of 3.2 reported from the Missouri valley, covers the entire valley; if divided an excess of 2.7 would have been credited to the Lower valley, and a deficiency of about 9.0 to the Upper valley. On the Pacific coast the greatest deficiency is reported from the central region, 3.0.

Maximum and Minimum Temperatures.—*Maine*: *Cornish, 70°; Portland, 65°; Eastport, 17°; *Orono, 14°. *New Hampshire*: *Contocookville, 76°; Mt. Washington, 40°; *Dunbarton, 18°; Mt. Washington, —12°. *Vermont*: *Windsor, 74°; Burlington, 69°; Burlington, 16°; *Lunenburg and *Newport, 14°. *Mass.*

Massachusetts: *Springfield Armory, 79°; Springfield, 77°; Thatcher's Island, 20°; *South Lee and *Somerset, 18°. *Rhode Island*: *Fort Adams, 64° and 24°; Newport, 63° and 26°. *Connecticut*: *Southington, 78°; New Haven, 75°; New London, 24°; *Southington, 19°. *New York*: *Ardenia, 81°; New York City, 76°; Rochester and Buffalo, 20°; *Schroon Lake and *Plattsburg Barracks, 16°. *New Jersey*: *Dodge Mines, 87°; Barnegat, 79°; Atlantic City, 24°; *New Lisbon and *Vineland, 22°. *Pennsylvania*: Pittsburgh, 84°; Erie, 26°; *Franklin, 15°. *Delaware*: Delaware Breakwaire, 79° and 32°; *Dover, 32°. *Maryland*: *Sandy Springs, 85°; Baltimore, 80° and 30°; *Woodstock, 23°. *District of Columbia*: Washington, 82° and 28°. *Virginia*: *Accotink, 90°; Norfolk, 84° and 27°; *Wytheville, 23°. *West Virginia*: *Helvetia, 82° and 15°; Morgantown, 81° and 28°. *North Carolina*: Wilmington and *Weldon, 90°; Charlotte and Kittyhawk, 33°; *Sulphur Springs, 25°. *South Carolina*: Charleston, 85° and 33°. *Georgia*: *Gainesville, 92°; Augusta and Savannah, 88°; Atlanta and Augusta, 36°; *McPherson Barracks, 29°. *Florida*: *Houston, 96°; Jacksonville, 91° and 42°; *St. Augustine, 41°. *Alabama*: Montgomery, 90° and 40°. *Louisiana*: *Okalooska, 94° and 35°; Shreveport, 93° and 40°. *Arkansas*: *Mount Ida, 95° and 32°; Little Rock, 94° and 43°. *Texas*: Eagle Pass and Rio Grande City, 105°; Fort Elliott, 26°; *Fort Concho, 25°. *Tennessee*: *Ashwood, 89°; Chattanooga, 88°; Knoxville and *Ashwood, 30°. *Kentucky*: Louisville, 87° and 31°; *Bowling Green, 30°. *Ohio*: *Cincinnati, 87°; Cincinnati, 83°; Cleveland, 27°; *Wooster and *Westerville, 22°. *Indiana*: *Laconia, 87°; Indianapolis, 83° and 27°; *Vevay, 24°. *Illinois*: *Mount Sterling, 86°; Cairo, 83°; Chicago, 27°; *Riley, 20°. *Michigan*: *Hudson, 80°; Port Huron, 73°; Alpena, 14°; *Fort Brady, 4°. *Wisconsin*: *Beloit, 80; Madison, 78° and 23°; *Neillsville, 18°. *Missouri*: *Corning, 94°; St. Louis, 86° and 30°; *Pierce City, 26°. *Iowa*: *Glenwood, 92°; Des Moines, 84°; Dubuque and Des Moines, 26°; *Logan, 15°. *Minnesota*: Breckenridge, 80° and 13°. *Indian Territory*: Fort Sill, 96°; Fort Gibson, 34°. *Kansas*: *Holton and *Cedar Vale, 94°; Dodge City, 92° and 24°. *Nebraska*: *Howard, 97°; North Platte, 90° and 20°; *Camp Sheridan, 15°. *Dakota*: *Fort Hale, 90°; Yankton, 82°; Pembina, —3°. *New Mexico*: Socorro, 80°; Santa Fé, 17°; *Fort Union, 14°. *Colorado*: Denver, 77° and 20°; *Fort Garland, 10°; Pike's Peak, 32° and —9°. *Wyoming*: *Fort Fetterman, 77°; Cheyenne, 73° and 15°; *Fort Fred Steele, 10°. *Montana*: Fort Benton, 81°; Fort Assiniboine, —20°. *Idaho*: Boise City, 79° and 30°; *Fort Hall, 10°. *Utah*: Salt Lake City, 75° and 27°; *Camp Douglass, 75° and 23°. *Nevada*: *Fort McDermit, 80°; Winnemucca, 74° and 22°. *California*: *Fort Yuma, 96°; Red Bluff, 88°; Campo, 24°. *Oregon*: Umatilla, 89° and 29°; Roseburg, 29°. *Arizona*: Yuma, 94°; Fort Apache, 20°. *Washington Territory*: Olympia, 82° and 28°.

Those marked with a star (*) are reported by U. S. Army Post Surgeons or Voluntary Observers.

Ranges of Temperatures at Signal Service Stations.—The monthly ranges will appear from the maxima and minima just given. The greatest daily ranges vary in New England from 19° at Wood's Holl to 35° at Boston; Middle Atlantic States, 19° at Cape May to 41° at Albany; South Atlantic States, 17° at Cape Lookout to 34° at Augusta and Wilmington; Eastern Gulf States, 13° at Key West and 24° at Pensacola to 32° at Montgomery; Western Gulf States, 21° at Galveston to 35° at Corsicana; Tennessee and Ohio valley, 24° at Cairo to 48° at Pittsburgh; Lower Lake region, 29° at Oswego to 41° at Cleveland; Upper Lake region, 24° at Grand Haven to 39° at Milwaukee; Upper Mississippi valley, 30° at La Crosse to 43° at Des Moines; Red River of the North valley, 42° at Pembina and 50° at Breckenridge; Missouri valley, 30° at Leavenworth to 51° at Fort Buford, and 53° at Omaha; Rio Grande valley, 31° at Rio Grande city to 45° at Eagle Pass; Eastern Rocky Mountain Slope, 33° at Virginia City to 53° at North Platte, and 54° at Fort Elliott; Plateau Districts, 33° at Boise City and Salt Lake City, 42° at Santa Fe; Pacific slope, 19° at San Francisco to 36° at Red Bluff.

Frosts.—Freezing temperatures were occasionally reported from Signal Service Stations as follows: Northern Pacific coast region, till 8th; Plateau districts, except southern Arizona, till 29th; along central and northern Rocky Mountain slope, and, north of 42nd parallel, eastward to the Atlantic Ocean, throughout month; east of Mississippi valley and north of 33rd parallel, till 12th; northern Ohio and Pennsylvania, till 30th. The following cases of interest are noted: *Alabama*: Heavy frost, 11th to 14th, killing vegetables, injuring fruit, corn, wheat and cotton at Troy, Greensboro, Blountsville, Wetumpka and other places. *Delaware*: 11th, general and severe throughout peninsula, seriously damaging peach blossoms. *Georgia*: 9th to 12th, severe, killing fruit and vegetables and damaging much cotton in northern half of State. *Kentucky and Tennessee*: 9th to 12th, severe, killing fruit and vegetables and injuring wheat. *Louisiana*: Okalooska, 9th. *Mississippi*: Vicksburg and Fayette, 9th and 10th. *Ohio*: 30th, damaging gardens and fruit somewhat. *Texas*: 8th and 9th, general in interior of State as far south as Castroville and Uvalde. *Arizona*: Burkes, 19th. *California* near Mt. St. Helena, 18th destroying peach crop first time in 16 years.

Ice was general north of parallel 40°. The following cases are noted as of interest: *Georgia*: Forsyth, 13th; Augusta, 10th, thin, in country near. *North Carolina*: Weldon and Wilmington, 12th; Charlotte, Statesville and Lenoir, 12th and 13th. *Indiana*: Logansport, 30th. *Tennessee*: Ashwood, 9th. *Virginia*: Walnut Grove, Johnstown and Mt. Solon, 12th. *New Jersey*: Newark, 30th. *Kansas*: Holton, 27th.

PRECIPITATION.

The general distribution of the rain-fall, including melted snow, for April, 1880, is illustrated upon chart No. III, as accurately as possible from about 500 reports. On the chart is given average precipitation for April. As will appear from that table, slight deficiencies are reported from Minnesota, the Eastern Gulf and Middle Atlantic States, and a slight excess from the Western Gulf States. Deficiencies of from one